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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/798,556	03/12/2004	Hiromasa Sato	250241US3CONT	6465
22850	7590	10/24/2005		EXAMINER
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			CHANG, AUDREY Y	
			ART UNIT	PAPER NUMBER
			2872	

DATE MAILED: 10/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/798,556	SATO ET AL. <i>AM</i>
	Examiner	Art Unit
	Audrey Y. Chang	2872

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 25 August 2005.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 4-7 and 12-14 is/are pending in the application.
 - 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 4-7 and 12-14 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) Notice of Informal Patent Application (PTO-152)
- 6) Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on **August 25, 2005** has been entered.
2. This Office Action is also in response to applicant's amendment filed on **July 25, 2005** which has been entered into the file.
3. By this amendment, the applicant has amended claims 4-7, 12, and 14 and has canceled claim 3.
4. **Claims 4, 12 and 14 have been amended to include the feature “a second (or a third diffraction grating as in claim 14) diffraction grating comprising a single layer inorganic film” that is not strictly supported by the elected species -- Figure 1.** Figure 1 is drawn to the species that **both** outgoing side diffraction gratings are *formed in the surface of the substrate*. There is no *additional* “inorganic layer” present in the elected species. Figure 1 shows that the reflection outgoing side diffraction grating has a *reflective layer* (104) however the reflection grating is referred to be “the first outgoing side grating” in claims 5-6, and it is **not** referred to the “second outgoing side grating”. **Furthermore** the specification **fails to give support for identifying the reflective layer as the “inorganic layer film” and the inorganic layer film in the specification is related a substrate material for forming the diffraction grating within as shown in non-elected species (Figures 7 and on).** *The amendment* makes the claims **not read** on the elected species (Figure 1), **unless the single inorganic layer film is the substrate.** To show good sport for the applicant, claims 4-7, and 12-14 are still be examined **but only with the feature reads** on the elected species Figure 1, namely the diffraction gratings are formed in the surfaces of the transparent

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substrate and the single inorganic layer film is the substrate, any future amendment to make the single inorganic layer film differs from the substrate **WILL BE TREATED AS NON-ELECTED SPECIES AND THE CLAIMS WILL BE WITHDRAWN FROM CONSIDERATION.** The applicant is respectfully reminded while making the amendment to the claims, only features supported the elected species can be added or amended.

5. Claims 4-7 and 12-14 remain pending in this application.

Response to Amendment

6. The amendment filed **July 25, 2005** is objected to under 35 U.S.C. 132(a) because it introduces new matter into the disclosure. 35 U.S.C. 132(a) states that no amendment shall introduce new matter into the disclosure of the invention. The added material which is not supported by the original disclosure is as follows: **the newly amended claims 4, 12 and 14** recite the following features “the second outgoing-side diffraction grating *disposed* in the first outgoing-side diffraction grating” and “the third diffraction grating ... *disposed* in the second diffraction grating”. The specification simply **fails** to give support for such. The specification discloses the two outgoing side diffraction gratings have **different** pitches and **different** depth which are completely different diffraction gratings and therefore cannot be disposed within each other. The feature of one diffraction grating is completely not present in the other diffraction grating which makes the feature totally impossible and not supported by the specifications.

Applicant is required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 112

7. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it

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pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

8. **Claims 4-7 and 12-14 are rejected under 35 U.S.C. 112, first paragraph,** as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The reasons for rejection based on the newly added features are set forth in the paragraph above.

9. **Claims 4-7 and 12-14 are rejected under 35 U.S.C. 112, first paragraph,** as failing to comply with the enablement requirement. The claim(s) contains subject matter which was **not** described in the specification in such a way as to **enable** one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The specification and the claims **fail** to teach how could the second outgoing diffraction grating (or third diffraction grating as in claim 14) is capable of being "*disposed*" in the first outgoing side diffraction grating (or the second diffraction grating in claim 14). The specification teaches that the two outgoing side diffraction gratings (103 and 105) having *completely different pitches* (one is much bigger than the other) and *different step height or depth* which means the two diffraction grating cannot be "*disposed*" within each other since the specification and the claims **fail** to teach any "*combining*" or *effective* diffraction effects resulted from the "*disposition*" of one diffraction grating within the other. The specification also fails to teach if the second diffraction grating is disposed within the first, **how exactly** are the *grating pitches* and *grating depths* of the two diffraction grating being formed in the substrate since the pitch for diffraction grating (103) and the pitch for the diffraction grating (105) are drastically different and the depths are so different it is impossible to dispose a diffraction grating with less depth in a diffraction grating with greater depth or vise versa. One will simply destroy the grating specifics of the

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other and there is no way to have them disposed in each other. The feature concerning the “disposing” is therefore **not enable** by the specification and the two gratings are two independent gratings.

Claim Objections

10. Claims 4-7 and 12-14 are objected to because of the following informalities:

(1). **Claims 4, 12 and 14 have been amended** to include the feature “the second outgoing-side diffraction grating (or the third diffraction grating as in claim 14) comprising a single layer inorganic film” that is *confusing and indefinite* since it is not clear what is considered to be this “single layer inorganic film”, (please also referred to the comments stated above). It is not clear how does this single layer *relate* to the substrate layer and it is not clear if this layer is referred to a *reflective layer or not* (as in Figure 1). But if this layer is referred to the reflective layer, then it is *not supported* by the specification and it will be contradicted with the features in claims 5-7. For the examination purpose, this layer is being examined as *the substrate layer*, **however the claims needed to be amended to fix the indefiniteness.**

(2). The amended phrase “saw-tooth shape” recited in claim 7 is confusing since it is not clear if this is referred to the saw-tooth or the pseudo sawtooth diffraction grating as recited in its based claim 6.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

12. Claims 4-6, 12 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patent issued to Nakanishi et al (PN. 6,728,034).

The claims contain numerous confusions and indefiniteness and for the purpose of examination the claims are being interpreted most faithfully to the elected species Figure 1. In particularly the “single layer inorganic film” is interpreted as the substrate.

Nakanishi et al teaches a *diffractive optical element* that is comprised of a transparent *substrate* (1, Figures 6, 7A, 7B, 10 and 22), wherein a first *diffraction grating pattern* (4), serves as the *incoming-side diffraction grating*, is formed on the *central* region of the incoming-side surface of the *transparent substrate* wherein an external light incidents (L0), and at least one *second diffraction gratings* (5 and 6, or 9 and 10), serves as the *first outgoing-side diffraction and second outgoing-side diffraction grating*, formed on the opposite (or *outgoing-side*) surface, (with respect to the first diffraction grating pattern), of the substrate. Nakanishi et al teaches that the *pitch* of the incoming side diffraction grating pattern is the *same* as the *pitch* of the outgoing-side diffraction grating pattern, (please see column 3, lines 38-40 and column 10, lines 40-52). Nakanishi et al further teaches that each of the first and second diffraction grating patterns comprises a plurality of *slits* and as demonstrated by the drawings 1-17 and 19A, the slit pattern comprises *concave/convex shape*, (please see columns 3-4, 6, 8, and 10). Nakanishi et al teaches that the first and second outgoing-side diffraction gratings (5 and 6) is configured to receive the light diffracted from the incoming-side diffraction grating (4). Nakanishi et al teaches that the outgoing side diffraction grating can be designed to be reflective grating, as demonstrated in Figures 6, 7A, and 7B).

Claims 4, 12 and 14 have been amended to include feature that the second outgoing side diffraction grating comprises a single layer of inorganic film. Nakanishi et al teaches that the outgoing side diffraction gratings are formed directly in the surface of the *substrate* which is a *glass substrate*. One skilled in the art would understand that glass in general is *inorganic* particularly the kind includes silica which is most often used as optical substrate.

Claims 4, 12 and 14 have been amended to include the feature that the second outgoing side diffraction grating is disposed in the first outgoing-side diffraction grating. This feature is rejected both under new matters rejection as not supported by the specification and not enable by the specification. It therefore really cannot be examined here. Nakanishi et al teaches that the two outgoing side diffraction gratings (5 and 6) can have the same pattern and grating specifics which means they could be disposed within each other to make a one single outgoing side diffraction grating that covers the whole outgoing surface of the substrate for the benefit of allowing more efficient diffraction of the light beams as desired.

With regard to claim 5, **Nakanishi** et al teaches that the outgoing side diffraction gratings (5 and 6, Figures 6-7B) may also be *reflection* type diffraction gratings.

With regard to claim 6, **Nakanishi** et al teaches that the outgoing side diffraction gratings (9 and 10, Figure 10) have a saw-tooth like diffraction grating profile.

With regard to claim 12, Nakanishi et al teaches that the diffractive optical element can be used in an optical pickup device which could be considered as a wavelength measurement apparatus.

13. Claims 7 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over the patents issued to Nakanishi et al as applied to claims 1 and 12 above, and further in view of the patent issued to Chen et al (PN. 5,914,811).

The diffractive optical element taught by **Nakanishi** et al as described for claims 1 and 12 above have met all the limitations of the claim. The Nakanishi et al reference teaches that the outgoing side diffraction gratings may have *saw-tooth like shape* (9 and 10 in Figure 10), however it does not teach explicitly that the diffraction gratings are of *pseudo* saw-tooth like shape that is approximated by multiple stepped stairs. It also does not teach explicitly that the incoming diffraction grating is of saw-tooth shape. However using multiple stepped stairs structure to *approximate* the desired diffraction grating profile is rather well known in the art for it provides good accuracy for approximating the desired profile. **Chen** et

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al in the same filed of endeavor teaches explicitly that a *blazed* grating (i.e. saw-tooth like grating) can be approximated by blazed grooves with M-step stairs, (please see Figures 1 and 2). Chen et al teaches that the step heights are selected to best approximate the diffraction profile. It would then have been obvious to one skilled in the art to apply the teachings of Chen et al to use M-step stairs structure to approximate the saw-tooth like gratings and to make the incoming-side grating with such structure for the benefit of providing more accurate grating profiles for the diffraction gratings.

Response to Arguments

14. Applicant's arguments filed on July 25, 2005 have been fully considered but they are not persuasive. The newly amended claims have been fully considered and they are rejected for the reasons stated above.

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Audrey Y. Chang whose telephone number is 571-272-2309. The examiner can normally be reached on Monday-Friday (8:00-4:30), alternative Mondays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on 571-272-2312. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A. Chang, Ph.D.

*Audrey Y. Chang
Primary Examiner
Art Unit 2872*